

REMARKS

Claims 1-5 and 7-19 are pending in the application. All of the claims have been rejected. Applicant acknowledges with appreciation the withdrawal of the rejection of claims 9 and 17-19 under 35 U.S.C. § 112. Claims 2, 6, 12-15 and 17 have been canceled without prejudice. Thus, the rejections to these claims have been obviated. Independent claim 1 and dependent claim 6 have been amended as shown in the above "in the claims" section. Applicant respectfully traverses the remaining rejections and seeks favorable reconsideration in view of the following remarks.

The Examiner objected to the drawings are under 37 CFR § 1.83(a). Rule 1.83(a) provides that "[t]he drawing[s]...must show every feature of the invention specified in the claims." The Examiner asserts that in view of Rule 1.83(a), "the plurality of drag pumping mechanism rotors attached to the turbomolecular pumping mechanism rotor as in claim 5 must be shown or the feature(s) canceled from the claim(s)." The Examiner requires "[c]orrected drawing sheets in compliance with 37 CFR 1.121 (d)...in reply to the Office action to avoid abandonment of the application." "[T]he examiner maintains that the drawings do not substantially show multiple molecular drag pumping rotors." Applicant has enclosed new FIG. 7 which shows that "the molecular drag pumping mechanism has a plurality of rotors affixed to the rotor blades of the turbomolecular pumping mechanism" as claimed in dependent claim 5. Support for new FIG. 7 is found on page 8, lines 19-23 to page 9, lines 1-3, FIGS 1 and 6 and claim 5 of the application as filed. No new matter has been introduced. Applicant has also amended the Specification as described above in the "in the specification" section in order to include FIG. 7 in the list of drawings and to reference FIG. 7 in the text. Accordingly, Applicant respectfully requests withdrawal of the objection to drawings.

The Examiner rejected claims 1-5, 7-9 and 13-19 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,135,709 ("Stones"). The Examiner "believes that Stones substantially teaches a molecular drag pumping mechanism affixed to the rotor blades." More specifically, the Examiner asserts that "Stones teaches a vacuum pumping arrangement comprising...a rotor (9) of the molecular drag pumping mechanism (2) is affixed to (via rotor 9 and rotor body 52, see col. 2, ln. 66-67) the rotor blades (54) of the turbomolecular pumping mechanism (50)." The Examiner reasons that "intervening elements in the linkage...[are] not

precluded by the present claim language...[and] ‘affixed to’ may be reasonably interpreted in a broad fashion to read on the embodiment disclosed by Stones.” Applicant respectfully disagrees and maintains, for all of the reasons set forth in the October 22, 2008 Amendment, that Stones fails to disclose that “a rotor of the molecular drag pumping mechanism is affixed to the rotor blades of the turbomolecular pumping mechanism” as claimed in independent claim 1 and dependent claims 2-4, 7-9 and 13-19.

In addition, independent claim 1 has been amended to include the elements of dependent claim 2. Amended independent claim 1 claims “A vacuum pumping arrangement comprising...a molecular drag pumping mechanism...wherein a rotor of the molecular drag pumping mechanism is affixed to the rotor blades of the turbomolecular pumping mechanism; and wherein the rotor blades of the turbomolecular pumping mechanism are provided with an annular ring to which the rotor of the molecular drag pumping mechanism is fixed.” The Examiner asserts that “Stones teaches an annular ring (at the interface between the blade supports, shaft, and rotor 9) provided to the rotor blades (54) to which the rotor (9) of the molecular drag pumping mechanism (2) is fixed.”

Applicant respectfully disagrees with the Examiner’s assertions and requests favorable reconsideration in view of the following remarks. In furtherance of Applicant’s October 22, 2008 Remarks, Applicant respectfully submits that Stones simply fails to disclose that the “rotor blades [are] provided with an annular ring to which the rotor of the molecular drag pumping mechanism is fixed” as claimed in amended independent claim 1. The Examiner asserts that Stones teaches an annular ring “at the interface between the blade supports, shaft, and rotor (9).” As best understood by Applicant the Examiner is referring to the cylindrical rotor body (52) (i.e. blade supports – See the diagonal cross-hatching on both the vertical and horizontal portions of the body 52), the shaft (6) and the rotor (9) as shown in FIG. 3 of Stones. Stones discloses that “mounted on the rotor 9 for rotary movement therewith is a cylindrical rotor body 52 from which extend...rotor vanes 54...” col. 2, ln 66-67 to col. 3, ln; FIG. 3. FIG. 3 shows that a portion of the rotor (9) is connected to a portion of the cylindrical rotor body (52). Nowhere does Stones disclose or even suggest that “the rotor *blades* of the turbomolecular pumping mechanism are provided with [an additional element,] an *annular ring* to which the rotor of the molecular drag pumping mechanism is fixed” as claimed in amended independent claim 1. *Emphasis added.* Indeed, the “annular ring” as claimed is an element in addition to the turbomolecular pumping

mechanism rotor blades and the molecular drag pumping mechanism rotor. Like Stones, Applicant discloses in the Specification and FIG. 1 that “[a] circumferential array of angled rotor blades 58 extend radially outwardly from rotor body 52.” p. 6, ln 8-9 of the application as filed; FIG. 1. Applicant further discloses that “an annular support ring 60 is provided, to which is fixed the drag cylinder or rotor, 62 of the molecular drag pumping mechanism 18...” p. 6, ln 9-13 of the application as filed; FIG. 1. Thus, as shown in Applicant’s FIG. 1, as described in Applicant’s Specification and as claimed in amended independent claim 1, the annular ring is an element in addition to and separate from the rotor body and/or rotor of the molecular drag pumping mechanism. Moreover, the apparatus of Stones teaches away from an “annular ring” because the molecular drag cylinders (shown in FIG. 3 but not numerically labeled) form part of the rotor (9) and are not affixed to the molecular pump rotor vanes (54). Thus, there is no need for an annular ring in the apparatus of Stones. In addition, Applicant respectfully submits that Stones fails to disclose that the rotor vanes 54 are provided with any element that can be construed as an annular ring. Accordingly, Stones simply fails to disclose or even suggest an “annular ring” and more particularly, Stones fails to disclose “wherein the rotor blades of the turbomolecular pumping mechanism are provided with an annular ring to which the rotor of the molecular drag pumping mechanism is fixed” as claimed in amended independent claim 1. Thus, Applicant respectfully requests withdrawal of the rejection to amended independent claim 1.

Claims 3-5, 7-9, 16 and 18-19 depend either directly or indirectly from amended independent claim 1. Accordingly, Applicant respectfully submits that claims 3-5, 7-9, 16 and 18-19 are not anticipated by Stones for at least the reasons set forth above. Claims 13-15 and 17 have been canceled without prejudice and thus, the rejections to these claims has been obviated.

In addition, regarding dependent claim 3, the Examiner asserts that “Stones teaches that the turbomolecular pumping mechanism (50) has a plurality of stages (as shown in Fig. 3), and that the rotor blades (54) as a whole are provided with the annular ring.” It appears that the Examiner is asserting that the cylindrical rotor body (52) in FIG. 3 of Stones is an “annular ring” as claimed in dependent claim 3. As discussed above with respect to amended independent claim 1, Applicant respectfully submits that the “annular ring” is a separate element from the cylindrical rotor body. *See* p. 6, ln 8-13 of the application as filed; FIG. 1. Stones simply fails to disclose that “the turbomolecular pumping mechanism has a plurality of stages and the rotor

blades...are provided with the annular ring” as claimed in dependent claim 3. Accordingly, for this further reason, dependent claim 3 is not anticipated by Stones.

The Examiner rejected dependent claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Stones in view of U.S. Patent No. 4,465,434 (“Rourk”). Section 103(a) provides that “[a] patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.”

The Examiner concedes that “Stones does not teach the use of specific materials in his vacuum pump.” However, the Examiner asserts that “it is known that turbomolecular and molecular drag pumps generate heat.” The Examiner asserts that “Rourk teaches a carbon fiber composite turbine wheel, and that the use of carbon fiber composites increases the temperature at which a rotor may operate.” The Examiner further asserts that Rourk teaches “‘interlaminar shear stress associated with load transfer from radial to circumferential is minimized,’ (col. 2, ln. 3-5).” The Examiner concludes that “it would have been obvious...to form the rotor of the molecular drag pump of Stones from a carbon fiber composite as taught by Rourk in order to increase heat resistance and minimize interlaminar shear stress.”

Applicant respectfully maintains, for all of the reasons set forth in the October 22, 2008 Amendment, that Stones fails to disclose that “a rotor of the molecular drag pumping mechanism is affixed to the rotor blades of the turbomolecular pumping mechanism” as claimed in independent claim 1 from which claim 10 depends. In addition, as discussed above with respect to amended independent claim 1, Applicant respectfully submits that Stones fails to disclose an “annular ring” and more specifically, “wherein the rotor blades of the turbomolecular pumping mechanism are provided with an annular ring to which the rotor of the molecular drag pumping mechanism is fixed” as claimed in amended independent claim 1 from which claim 10 depends. Indeed, the “annular ring” as claimed is a separate element from the rotor body (52) (*See* p. 6, ln 8-13 of the application as filed; FIG. 1) and while Stones teaches a cylindrical rotor body (52) (*See* FIG. 3 – note the diagonal cross-hatching on both the vertical and horizontal portions of the body 52), Stones simply fails to teach an “annular ring” as claimed in amended independent

claim 1 from which claim 10 depends. Moreover, the apparatus of Stones teaches away from an “annular ring” because the molecular drag cylinders (shown in FIG. 3 but not numerically labeled) form part of the rotor (9) and are not affixed to the molecular pump rotor vanes (54). Thus, there is no need for an annular ring in the apparatus of Stones. Accordingly, Stones, either alone or in combination with Rourk, fails to teach “wherein the rotor blades of the turbomolecular pumping mechanism are provided with an annular ring to which the rotor of the molecular drag pumping mechanism is fixed” as claimed in dependent claim 10. Thus, Applicant respectfully requests withdrawal of the rejection to dependent claim 10.

The Examiner rejected dependent claims 11-12 under 35 U.S.C. § 103(a) as being unpatentable over Stones in view of U.S. Patent No. 5,230,924 (“Schofield”). The Examiner concedes that “Stones does not teach the use of specific materials in his vacuum pump.” However, the Examiner asserts that “Schofield teaches that aluminum is generally useful for combined regenerative/Holweck pumps (col. 3, ln. 26-29).” The Examiner concludes that “it would have been obvious...to use aluminum to form elements of the vacuum pump of Stones.”

Dependent claim 12 has been canceled without prejudice and thus, the rejection of claim 12 has been obviated. In addition, Applicant respectfully maintains, for all of the reasons set forth in the October 22, 2008 Amendment, that Stones fails to disclose that “a rotor of the molecular drag pumping mechanism is affixed to the rotor blades of the turbomolecular pumping mechanism” as claimed in independent claim 1 from which claim 11 depends. Moreover, as discussed above with respect to amended independent claim 1, Applicant respectfully submits that Stones fails to disclose an “annular ring” and more specifically, “wherein the rotor blades of the turbomolecular pumping mechanism are provided with an annular ring to which the rotor of the molecular drag pumping mechanism is fixed” as claimed in amended independent claim 1 from which claim 11 depends. Indeed, the “annular ring” as claimed is a separate element from the rotor body (52) (*See* p. 6, ln 8-13 of the application as filed; FIG. 1) and while Stones teaches a cylindrical rotor body (52) (*See* FIG. 3 – note the diagonal cross-hatching on both the vertical and horizontal portions of the body 52), Stones simply fails to teach an “annular ring” as claimed in amended independent claim 1 from which claim 11 depends. In addition, the apparatus of Stones teaches away from an “annular ring” because the molecular drag cylinders (shown in FIG. 3 but not numerically labeled) form part of the rotor (9) and are not affixed to the molecular pump rotor vanes (54). Thus, there is no need for an annular ring in the apparatus of Stones.

Accordingly, assuming *arguendo*, even if Stones were combined with Rourk, the combination would not achieve the invention as claimed in independent claim 1 from which claim 11 depends. Thus, Applicant respectfully requests withdrawal of the rejection to dependent claim 11.

In summary, Applicant respectfully submits that claims 1, 3-5, 7-9, 16 and 18-19 are not anticipated by Stones for all of the reasons set forth above. Moreover, Applicant respectfully submits that claim 10 is not rendered obvious by Stones either alone or in combination with Rourk and dependent claim 11 is not rendered obvious by Stones either alone or in combination with Schofield for all of the reasons set forth above. In addition, Applicant respectfully submits that the objection to the drawings has also be overcome. Accordingly, Applicant respectfully requests withdrawal of the objection and rejections and that the application be promptly passed to issue.

The Office Action contains numerous statements reflecting characterizations about the invention(s), the claims, and the related art with which Applicant does not necessarily agree. Regardless of whether any such statement or characterization is discussed above, Applicants declines to subscribe to any statement or characterization in the Office Action.

Applicant has enclosed a request for a one-month extension of time. Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully Submitted,

Edwards Vacuum, Inc.
55 Madison Avenue, Suite 400
Morristown, NJ 07960
Phone: 973-285-3309
Fax: 973-285-3320

/Mary K. Nicholes, Reg. No. 56,238/
Mary K. Nicholes
Registration No. 56,238
Attorney for Applicant(s)
Date: May 13, 2009

Customer No.: 71134